No. XII.

A Deſcription of the Pendant Planetarium. By BURGISS ALLISON.

Read May 2d, 1800.

a a a a is a frame ſupporting the whole machine. *b b* is a fixed rod or arbor ſupporting the ſegment *c*, and the ſun *s* by a fine wire. *d* is a wheel fixed to the upper part of the cannon *e* carrying round by its lower end the arm *f f* and the planet Mercury ſuſpended by a fine dark wire. *g g* is an arm fixed by ſcrews into the frame *a a* at each end, and alſo to the upper end of the fixed cannon *h h*, which ſupports by its lower end the frame *i i*, which, as explained in fig. 2. is an elliptic plane, ſupporting by four or more ſtuds *l l* the concave piece *k k* forming an elliptic ring. *m m* is a wheel on the moveable cannon *n n* which carries the arm *o o*, ſupporting on one end the planet Venus by a fine wire, as above. *p p* as before is a fixed frame attached to the immoveable cannon *q* and the elliptic plane *r r*, ſupporting by ſtuds the concave ring *s s*, ut ſupra; and thus the wires by which the planets are ſuſpended, and the concave rings are alternately ſupported by the moveable and fixed cannons, &c. until the whole forms a concave like the heavens; having the ſmall grooves or apertures through which the planets ſupporters move round, forming elliptic lines in the concave ſegment of a ſphere marking out the planets paths, according to their excentricity and ſhewing at one view the places of aphelion, perihelion, &c. of all the planets. The concave ſegment being painted a dark blue and ſpangled with ſilver ſtars in the poſition that ſome of the fixed ſtars would appear from the centre of the ſun, will have a fine

fine effect, eſpecially as the ſupporting wires of the planets will be dark and ſo ſmall as to render them almoſt inviſible, the frame being ſuſpended from the ceiling. Their latitude may readily be aſcertained by a line drawn from the centre of the ſun through that of the planets place to the hoop *t t* encompaſſing the whole, marked with eight degrees on each ſide of the ecliptic. The elliptic orbits and inclined planes are obtained by the method ſhewn in fig. 2. viz.

a a is an elliptic plane faſtened to the lower end of each fixed cannon, having its excentricity calculated to that of the planet which is to be affected by it. *b b* is the arm attached to the moveable cannon. *c c* is a ſlider moving on the arm *b b* by four little friction rollers. *d* is a friction wheel on the under ſide of *c* turning on a pin which is faſtened firm in *c* and moves, with it, through a groove in *b b* which wheel running againſt the edge of the ellipſis *a a*, forces *c c* out, which is again drawn in by the ſpring *e*, thus cauſing the planet to revolve in an elliptic orbit, as it is carried round by the arm *b b*, the moveable cannon, and wheel work.

For the inclined plane, *g* is a wheel turning on a pin faſtened into *c c*, and carried round on it by a projecting arm of *b**. On one ſide of this wheel is a ſmall pin, whoſe ſituation and diſtance from the centre is to be determined by the place of the planet's nodes and the inclination of its plane to that of the ecliptic: to this pin is faſtened a ſmall waxed ſilk cord which paſſing over the pulley *h* ſupports the planet by a fine hair wire, as before deſcribed and draws it up and lowers it down in its orbit according to its angle of inclination to the plane of the ecliptic. The planets ſhould be made of poliſhed metal to give them weight and brilliancy, or of ſmall glaſs

* The circumference of the wheel muſt be commenſurate with the diſtance *c c* moves out.

The Pendant Planetarium. by the Revd B. Allison.

Fig. 1.

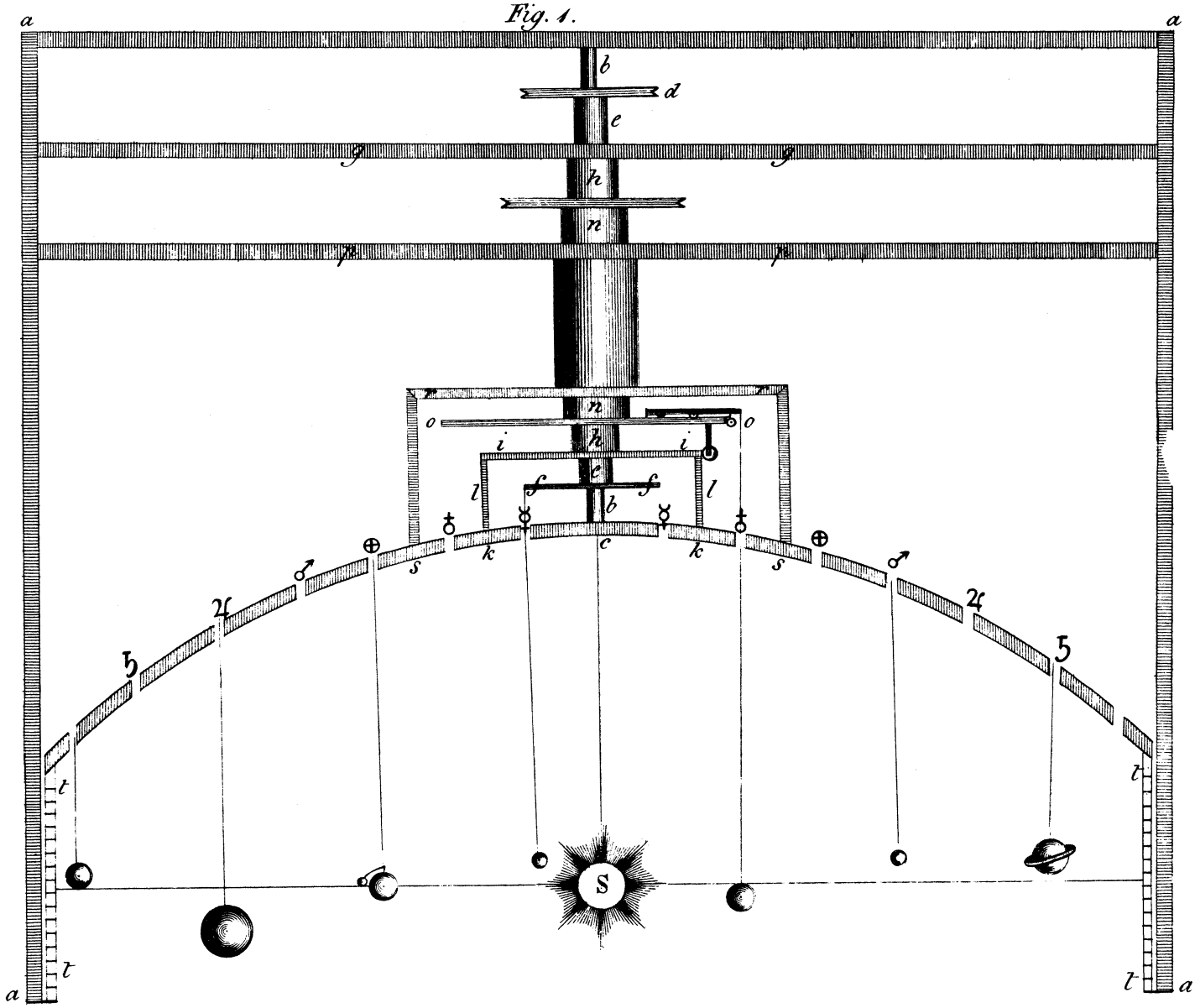
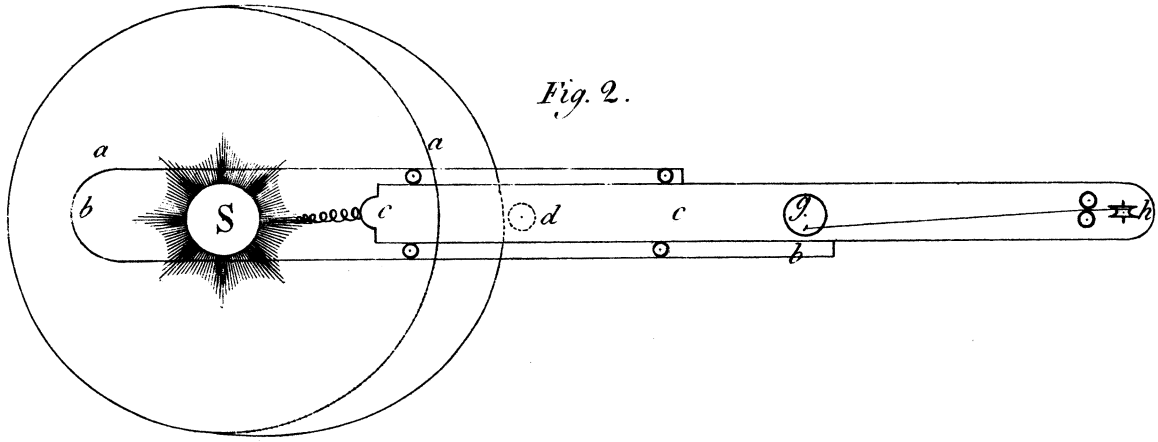


Fig. 2.



glaſs globes filled with mercury. The ſun may be a globular glaſs fountain-lamp with a cork fitted to the tube, containing a tin pipe for the wick, ſo that the blaze being in the centre of the globe and ſurrounded with oil, will be magnified on every ſide and exhibit a ſplendid ſun. It will be readily underſtood that motion is to be given to the wheels, turning the cannons, &c. by an arbor having as many wheels as the planets have, all firmly fixed to the arbor and calculated to move them in their proper periods. The whole may be made of wood, if required, and the wheels turned by elaſtic wire bands. To the machinery may be attached a ſimple movement whoſe weight may deſcend down the wainſcot of the room in any convenient place. Thus the planets will be ſeen moving round the ſun in the concave above, in elliptic orbits and inclined planes, apparently revolving in the heavens without any ſupport.

It is eaſy to conceive how the ſame principle, as far as it reſpects the excentricity and angles of inclination, may be applied to either vertical or horizontal orreries; by having the wires which ſupport the planets ſufficiently ſtout to bear their weight either in a perpendicular or horizontal poſition, and ſliding in and out of ſmall tubes as they paſs round in the elliptic grooves on the face of the orrery. They may be drawn in by the wheel pin and cord as deſcribed in fig. 2. and forced out by ſmall ſprings. In this caſe their latitude may be marked on the ſupporting wire, and the top of the tube in which they ſlide will ſerve as an index. Or the degrees may be marked on the edge of a groove cut in the tube through which an index, faſtened to the moving wire or ſtem which ſupports the planets, may paſs; and thus give the latitude.

BURGISS ALLISON.